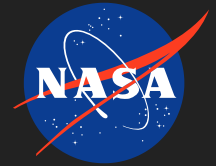


Software Tools that Control a Framework of Perceptual Interfaces and Visual Display Systems for Human-System Interaction with Robotic and Autonomous Systems, Phase I

Completed Technology Project (2007 - 2007)



Project Introduction

Turbogizmo, LLC will develop new software technology for Human-System Interaction (HSI) for NASA that increases performance and reduces the risk of conducting manned exploration missions. This HSI technology combines intelligent software agents, decision support systems and perceptual interfaces to facilitate human collaboration with robotic and autonomous systems while supporting the use of augmented cognition models. This will provide the optimal configuration of multi-modal user interfaces to improve performance and safety during critical mission operations. Future exploration missions will involve greater information availability for crewmembers and enhancements to EVA systems will provide visual information for situational awareness. HSI technology that manages the exchange of information between Human and Robotic or Autonomous systems using augmented cognition models will result in reduced cognitive load caused by inappropriate information while minimizing the effort required when interacting with autonomous systems. Turbogizmo proposes to develop a service-based architecture for configuring a suite of multi-modal HCI technologies based on operational scenarios, evaluation of perceptual interfaces with cost/value propositions for interface configurations. This framework will be validated by experimentation and demonstration. This technology will close a critical technology gap by enabling improved interaction for exploration crewmembers performing routine and contingency operations.

Anticipated Benefits

Potential NASA Commercial Applications: Most appropriate to the commercialization of technology developed for this topic will be the applications for use by first responders for homeland security and public safety officials for hazard mitigation during local emergency situations. HSI with visual information display technology can provide users with improved access to visual information such as procedures, checklists, technical drawings, images and training materials. This allows workers to access visual information even while they are engaged in demanding tasks in mobile environments. HSI for robotic and autonomous system collaborations will enable increased use of robotic assets for dangerous tasks to provide increased public safety and industrial productivity. Commercialization opportunities include the following market sectors: Public Safety: Firefighters, Police, Military, Security, Search and Rescue, Hazard Mitigation Industrial: Construction, Repair, Training, Inspection, Inventory, Logistics, Safety Commercial: IT for the Office, Sales, Marketing, Insurance, Analysis, Network Consumer: Shopping, Travel, Entertainment, Education, Security, Correspondence, Finance



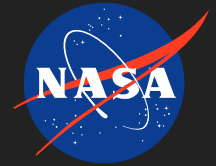
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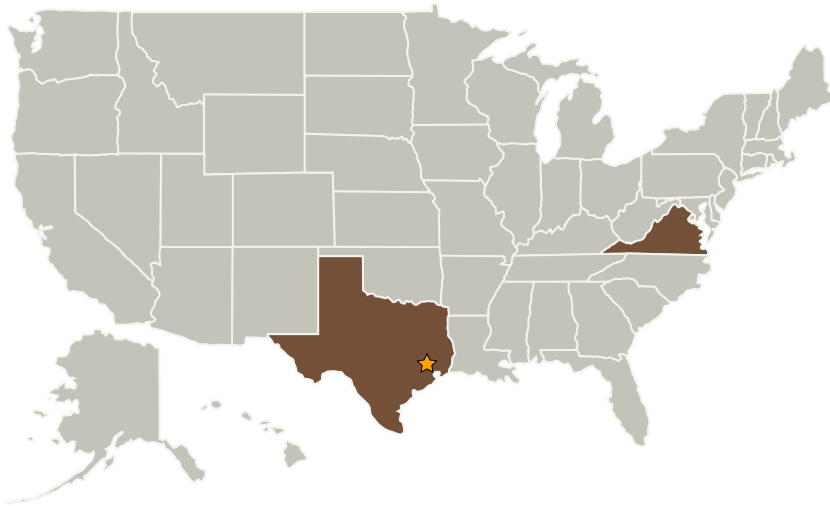
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Turbogizmo, LLC	Supporting Organization	Industry	Centreville, Virginia

Primary U.S. Work Locations	
Texas	Virginia

Project Transitions

January 2007: Project Start

July 2007: Closed out

Closeout Summary: Software Tools that Control a Framework of Perceptual Interfaces and Visual Display Systems for Human-System Interaction with Robotic and Autonomous Systems, Phase I Project Image

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Stephen J Schwartz

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - └ TX13.4 Mission Success Technologies
 - └ TX13.4.2 Team Preparedness and Training